Universitat Autònoma de Barcelona

2019/2020

Human Nutrition

Code: 103645
ECTS Credits: 2.5

Degree	Type	Year	Semester
2502442 Medicine	OB	2	2

Contact

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Use of Languages

Principal working language: catalan (cat)
Some groups entirely in English: No
Some groups entirely in Catalan: No
Some groups entirely in Spanish: No

Teachers

Enrique Domingo Ribas
Raquel Moral Cabrera

Prerequisites

Although no official prerequisites are defined for this subject, it is recommended that the student has acquired sufficient knowledge about
Medical Physiology I subject of the first semester of the second year, particularly about the physiology of the digestive system.

It is also necessary to have completed and achieved the basic knowledge in Biochemistry and Molecular Biology, Cell Biology and General
Physiology, subjects of the first course.

It is also advisable for the student to integrate the knowledge acquired in this subject with those of others of the same course that have
related contents: Medical Physiology II, Human Genetics, Medical Psychology.

Objectives and Contextualisation

The "Human Nutrition" is a compulsory subject that is programmed in the second year of the Bachelor's Degree of Medicine. It has a total of
2.5 ECTS credits and is taught by the Medical Physiology Unit of the Department of Cell Biology, Physiology and Immunology. In this subject,
the basic contents of nutrition and those of nutrition in special situations and in public health are developed. The student is also introduced in
the problem of the main nutritional imbalances. The training in Clinical and Hospital Nutrition will be carried out later, in the fifth year of the
Bachelor's Degree, within the subject of Endocrinology and Nutrition of the subject of "Medicine and Surgery" once the student has obtained the
knowledge of the diseases that will be tributary of nutrition support or application of principles and dietary recommendations for the recovery

and rehabilitation of the patient. Both blocks, basic and clinical training, are intimately related and the teaching program and the teaching staff
are coordinated between the two areas of knowledge in order to achieve teaching objectives.

The general objective of the subject of "Human Nutrition" is the acquisition of knowledge, practical skills and attitudes in the different disciplines
of nutrition and, in particular, its basic aspects, nutrition in special situations and in the potential of foods for the promotion of health, the
improvement of well-being and the reduction of the risk of illness.

The knowledge acquired with this subject is essential for all medical specialties. Nutritional imbalances, both malnutrition and obesity are serious
public health problems, being real epidemics of the 21st century. This subject belongs to an area of knowledge that has a fundamental content
and of great importance in the formation of the future doctor.

Competences

- Accept one's role in actions to prevent or protect against diseases, injuries or accidents and to maintain and promote health, on both personal and community-wide levels.
- Be able to work in an international context.
- Convey knowledge and techniques to professionals working in other fields.
- Demonstrate basic research skills.
- Demonstrate understanding of the basic sciences and the principles underpinning them.
- Demonstrate understanding of the causal agents and the risk factors that determine states of health and the progression of illnesses.
- Demonstrate understanding of the functions and interrelationships of body systems at different levels of organisation, homeostatic and regulatory mechanisms, and how these can vary through interaction with the environment.
- Demonstrate understanding of the principles of normal human behaviour and its alterations in different contexts.
- Demonstrate understanding of the structure and function of the body systems of the normal human organism at different stages in life and in both sexes.
- Demonstrate, in professional activity, a perspective that is critical, creative and research-oriented.
- Formulate hypotheses and compile and critically assess information for problem-solving, using the scientific method.
- Indicate the most suitable treatment for the most prevalent acute and chronic processes, and for the terminally ill.
- Obtain and prepare a patient record that contains all important information and is structured and patient-centred, taking into account all age and gender groups and cultural, social and ethnic factors.
- Recognize the determinants of population health, both genetic and dependent on gender, lifestyle, and demographic, environmental, social, economic, psychological and cultural factors.
- Use information and communication technologies in professional practice.

Learning Outcomes

1. Analyse body composition.
2. Analyse the characteristics of a diet that meets individual and community needs.
3. Analyse the impact on health of new trends in human food intake.

4. Analyse the potential of foods to promote health, improve well-being and reduce the risk of illness.
5. Apply the concepts of nutrigenetics and nutrigenomics.
6. Be able to work in an international context.
7. Convey knowledge and techniques to professionals working in other fields.
8. Demonstrate basic research skills.
9. Demonstrate, in professional activity, a perspective that is critical, creative and research-oriented.
10. Describe food hygiene and conservation processes.
11. Describe nutrients and their metabolism.
12. Describe nutritional needs in adulthood and old age.
13. Describe nutritional needs in infancy, childhood and adolescence.
14. Describe nutritional needs in physical exercise and sport.
15. Describe nutritional needs in pregnancy and breastfeeding.
16. Describe nutritional therapies, especially in the dietary treatment of diabetes mellitus, obesity, cardiovascular risk, renal and liver insufficiency and states of malnutrition.
17. Describe the alterations to physiological mechanisms that occur in eating disorders.
18. Describe the function of water, electrolytes and acid-base balance.
19. Describe the illnesses related to nutritional imbalances.
20. Describe the methodologies for assessing dietary habits and the nutritional state of a population.
21. Develop education on healthy nutrition and know the basics of dietary planning.
22. Establish nutritional counselling in illness and dietary intervention.
23. Evaluate the nutritional state.
24. Explain energy metabolism.
25. Explain enteral and parenteral nutrition, their therapeutic indications and their complications.
26. Explain the nutritional imbalances that result from eating disorders.
27. Explain the physiological mechanisms involved in the regulation of ingestion and energy expenditure.
28. Formulate hypotheses and compile and critically assess information for problem-solving, using the scientific method.
29. Formulate surveys on diet to assess dietary habits and the nutritional state.
30. Identify and describe the basic features of human nutrition.
31. Identify imbalances in body weight and nutritional states.
32. Identify the basic concepts in the area of foods, food intake, diet, nutrition and nutrients.
33. Identify the cultural and social aspects of food intake.
34. Identify the processes of digestion, transport and excretion of nutrients.
35. Identify the role of diet as part of a healthy lifestyle.
36. Organise hospital nutrition and dietetics.
37. Recognise healthy lifestyles, in particular those related to nutrition.
38. Use information and communication technologies in professional practice.
39. Work on the psychology of eating behaviours.

Content

A. NUTRITION BASICS

1. Basic concepts: nutrition, feeding, nutrients, diet.

2. Energy metabolism.

2.1. Components of energy expenditure.

2.2. Factors that influence energy expenditure.

2.3. Estimation of energy needs.

2.4. Energy from food.

3. The nutrients and their metabolism.

3.1. Water.

3.2. Carbohydrates.

3.3. Lipids.

3.4. Proteins.

3.5. Vitamins.

3.6. Minerals.

3.7. Conditionally essential nutrients.

4. Energy and dietary reference intakes.

5. Foods.

5.1. Components: nature, classification and functions.

5.2. Nutritional classification of foods.

5.3. Meat, fish and eggs.

5.4. Dairy products and derivatives.

5.5. Oils and fats.

5.6. Cereals and derivatives.

5.7. Tubercles.

5.8. Beans.

5.9. Dried fruit.

5.10. Fruits and vegetables.

5.11. Drinks and complementary foods.

6. Food guidance and food composition tables (TCA).

7. Characteristics of a healthy diet.

8. Regulation of the energy balance.

9. Nutrigenetics, nutrigenomics and nutriepigenetics.

10. Nutraceutics.

11. Nutrition and health.

12. Food and culture.

13. New tendencies in human nutrition.

13.1. Genetically modified foods.

13.2. Functional foods.

13.3. Dietary supplements.

B. NUTRITION IN SPECIAL SITUATIONS

1. Pregnancy and breastfeeding.

2. Early childhood, second childhood and adolescence.

3. Age and old age.

4. Exercise and sports

C. INTRODUCTION TO THE MOST PREVALENT NUTRITIONAL IMBALANCES

1. Evaluation of the state and the nutritional risk.

1.1. Nutrition status information.

1.2. Assessment of nutritional status: anthropometric parameters, body composition, and methods.

1.3. Determination: laboratory procedures.

1.4. Assessment of weightimbalances.

1.5. Malnutrition: energy, protein.

2. Eating disorders and metabolic nutritional consequences.

2.1. Anorexia nervosa.

2.2. Bulimia.

2.3. Orthorexia.

2.4. Nutrition and metabolic aspects related to alcoholic beverages and their excessive consumption.

3. Obesity.

3.1. Concept and classification.

3.2. Anthropometric indexes.

3.3. Generalized and central obesity.

4. Fasting.

5. Nutrition and cardiovascular system.

5.1. Cholesterol and arteriosclerosis metabolism. Healthy dietary recommendations.

5.2. Hyperlipidemia. Importance of diet in the prevention of dyslipidemia.

5.3. Nutrition and blood pressure. Healthy dietary recommendations.

6. Nutrition and endocrine pancreas.

6.1. Diabetes mellitus and metabolic syndrome.

7. Nutrition and Cancer.

7.1. Influences of nutritional factors in carcinogenesis.

7.2. Importance and limitations of the diet in secondary and primary prevention of cancer.

D. NUTRITION AND PUBLIC HEALTH

1. Healthy lifestyle and nutrition education for health.

2. Interactions between drugs and nutrients.

3. Nutrition and health claims of foods.

Methodology

- Theory classes:

Systematic explanation of the subject topics, giving relevance to the most important concepts. The student acquires the basic scientific knowledge of the subject in theory classes, which will be complemented by self-study of the themes of the subject program.

- Laboratory practices:

Practical sessions for the observation and performance of procedures, the practical learning of physiological techniques and their medical application. Group work and active self-learning are promoted.

- Case-based work:

Work on cases and problems of relevance for learning the subject. The knowledge acquired in theory classes, practices and personal study is applied to the resolution of practical cases presented using the moodle application.

- Tutorial teaching:

Availability of tutorials for helping in the autonomous study of physiological concepts and application for the resolution of cases.

Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
CASE RESOLUTION WORK (PA)	2	0.08	
LABORATORY PRACTICES (PLAB)	3	0.12	
THEORY (TE)	17	0.68	5
Type: Supervised			
TUTORIALS	9	0.36	

Type: Autonomous		
SELF-STUDY / PREPARATION OF CASE-BASED WORK AND PRACTICES	28	1.12

Assessment

The acquisition of the competences of the subject will be evaluated, including the learning of the Nutrition of the human organism, the training to distinguish between the normality and the dysfunction and the capacity of integration of theoretical and practical concepts.

Evaluation model:

- The theoretical and practical (laboratory and case practices) syllabus will be assessed.

- To pass the subject, it is necessary to obtain a minimum mark of of 5.0.

- Throughout the course, there will be several tests, a partial exam, and a final exam.

2. Continuous evaluation:

- The continuous evaluation will consist of:

a) A partial exam session to evaluate the different sections of the program:

A. Nutrition basics

B. Nutrition in special situations

C. Nutrition and public health

D. Introduction to the most prevalent nutritional imbalances

This exam will have two parts and its mark will be 90% of the overall final grade (45% ecah part). The exam will contain:

- multiple choice questions to evaluate the theoretical concepts; the mark of the theory block will be 75% of the overall final grade;

- multiple choice questions and/or short written questions of the concepts learned and trained in laboratory practices and case-based study; the mark of the practice block will be 15% of the overall final grade.

b) Tests throughout the course on the knowledge obtained in the laboratory and the case-based study:

- Evaluation of laboratory practice concepts and of case resolution work by means of on-site tests and/or questionnaires conducted on the Moodle application.

The mark of this set of tests will be 10% of the final grade.

In order to pass the subject through continuous evaluation, it is necessary to obtain a minimum of 5.0 in section a) and a minimum of 5.0 in section b).

3. Final exam

- A final examination for recovery will be carried out, in which the student will have to attend only if he has not passed the continuous evaluation of the same academic year.

- According to the general regulations of the UAB, to participate in the final examination, the student must have been previously evaluated in a set of activities whose weight equals to a minimum of two thirds of the total qualification of the subject.

- Students who have passed the continuous evaluation of the subject and want to attend to this final exam to improve their qualification must request this option in the conditions and dates specified in the call. In this case, the final grade will be the highest mark obtained in either the continuous evaluation or the final exam.

- The final exam will consist of tests of multiple choice questions from all parts of the syllabus and will comprehend the knowledge of:

- theory: the mark of this part will be 75% of the final grade;

- laboratory and case-based practices: the mark of this part will be 25% of the final grade.

To pass the subject through the final exam, it is necessary to obtain a minimum of 5.0 between the two parts.

It will be considered as "not assessable" the student who does not take the scheduled partial and final exams.

4. Exams reviewing procedure:

Students may submit claims to the statement of the exam questions during the two days following the completion of the examination.

The revision of the marks will be carried out in the schedule that will be announced together with thepublication of the qualifications of the partial and final exams.

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Written evaluation through objective tests: multiple choice questions and / or restricted questions essay tests and / or questionnaires in Moodle application	25%	1	0.04	1, 23, 8, 9, 10, 20, 21, 7, 22, 29, 28, 31, 36
Written evaluation through objective tests: multiple choice questions of theoretical knowledge	75%	2.5	0.1	3, 4, 2, 5, 11, 18, 17, 19, 12, 15, 14, 13, 16, 24, 26, 27, 25, 35, 33, 32, 34, 30, 37, 6, 39, 38

Bibliography

Specific bibliography:

- GIL A. Tratado de Nutrición (3ª ed.). Ed. Médica Panamericana. 2017.

- KATZ DL, FRIEDMAN RSC. Nutrition in clinical practice : a comprehensive, evidence-based manual for the practitioner. 2nd Edition.
Lippincott Williams & Wilkins, 2008

- MAHAN LK, RAYMOND JL. Krauser's. Food & The Nutrition care process. 14th edition. Elsevier, 2017.

- SOCIEDAD ESPAÑOLA DE NUTRICIÓN COMUNITARIA. Guía de la alimentación saludable. SENC, Madrid, 2004.

General bibliography:

- HALL JE. Guyton Textbook of Medical Physiology. 13th ed. Elsevier, 2015.

- TRESGUERRES JAF. Fisiología Humana. 4ª ed. Mc Graw Hill-Interamericana, 2010.

- MATAIX J. Nutrición y Alimentación Humana. (2a ed.). Ergón, 2009.

Internet resources:

- Agencia Española de Seguridad Alimentaria y Nutrición: http://www.aesan.msc.es/

- European Comission: Agriculture and rural development: http://ec.europa.eu/news/agriculture/index_es.htm

- World Health Organization (WHO): http://www.who.int/es/

- EUFIC - The European Food Information Council: https://www.eufic.org/en

- EFSA - European Food Safety Agency: http://www.efsa.europa.eu/

The specific bibliography for the laboratory practice will be provided with the practical guide.